(1) at least one signal processing circuit to process said pickup signal, wherein said at least one signal processing circuit is an automatic phase reversal circuit, which reverses the phase of said pickup signal;

(2) at least one amplifier circuit to amplify said pickup signal, to provide a drive signal at the amplifier output;

(B) a transducer, which attaches physically to the body of said musical instrument, wherein said drive signal is applied to said transducer, causing said transducer to produce acoustic vibrations in response to said drive signal, wherein some portion of vibration energy produced by said transducer is imparted from said transducer to said instrument body and to said vibratile elements, wherein said vibration energy which is transferred to said vibratile elements is sufficient to sustain the vibration said vibratile elements;

whereby automatic phase reversal of said pickup signal occurs when said pickup signal amplitude changes from a first amplitude to another, lesser amplitude, such that said change between said first amplitude and said lesser amplitude must exceed a predetermined rate of change;

wherein if said rate of change between said first amplitude and said second amplitude is less than said predetermined difference, said automatic phase reversal will not occur, but wherein if said rate of change between said first amplitude and said second amplitude is

equal to or greater than said predetermined difference, then said automatic phase reversal will occur,

12. The transducer of claim 11, wherein said musical instrument body has at least one solid surface on which to mount said transducer, said transducer comprising:

(a) a core made of magnetic steel or other magnetic material;

(b) a coil of electrically conductive wire wound around said core;

(c) two or more permanent magnets;

(d) one or more sheets of resilient material;

wherein said core protrudes from both ends of said coil such that substantially equal lengths, widths, heights, and shapes of said core protrude from both ends of said coil forming a symmetrical arrangement of core with respect to coil,

wherein said protruding core has at least two similar faces, one or more said faces being on one side of said coil and an equal number of corresponding said faces being on the other side of said coil, comprising a symmetrical arrangement of core faces about said coil,

wherein a said resilient sheet or sheets are sandwiched between one or more selected pairs of core faces and respective pairs of permanent magnet poles, wherein each pair of respective permanent magnetic poles are of opposite magnetic polarity facing said respective pairs of core faces,

wherein each pair of said magnets adjacent to corresponding core faces are of substantially equal size and shape so as to form a symmetrical arrangement of magnets oriented oppositely in polarity,

wherein connection of said coil or said electrical cable to the output of said amplifier of Claim 11 results in an alternating current in said transducer coil in response to said vibrations of said vibratory elements, wherein said alternating current induces an alternating magnetic flux in said core,

wherein said magnets and respective core faces vibrate with respect to each other in response to magnetic forces that result from said alternating magnetic flux,

wherein the opposing permanent magnet poles of each magnet from those poles mounted to said resilient sheet or sheets are rigidly attached onto a surface of said body of said musical instrument which is to be vibrated, or instead, said core is rigidly attached onto a surface of said body of said musical instrument,

wherein said musical instrument body is vibrated in response to said audio frequency current being produced in said transducer coil.

13. The transducer of claim 11, wherein the said opposing permanent magnet poles from those mounted to said resilient sheets are mounted onto one surface of a plate, and

wherein an opposing surface of said plate is rigidly mounted to said body of said musical instrument which is to be vibrated by said transducer.

14. The transducer of claim 12, wherein said plate is one side of a clamp means having two opposing sides, at least one of said two opposing sides being movable so as to firmly clamp a part of a body of said musical instrument or other body of mass between said two opposing sides of said clamp means.

15. A conductor routing means for combining first and second electrical signals through a single multi-conductor electrical cable,

wherein said first signal is said pickup signal of said musical instrument of Claim 11, and said second signal is said drive signal of claim 11, wherein the function of said transducer is to vibrate said body of said musical instrument in response to said drive signal, said transducer being mounted to the body of said instrument, in order to sustain the vibrations if said vibratile elements;

wherein a first signal conductor which carries said first signal joins to a first conductor of said multi-conductor electrical cable and wherein said second signal cable carrying said second signal joins to a second conductor of said multi-conductor electrical cable;

wherein said junctions of said first and second signal conductors to respective said first and second conductors of said multi-conductor cable are attached to said instrument.

16. The conductor routing means of claim 15, wherein said junctions of said first and second signal conductors to respective said first and second conductors of said multi-conductor cable are attached to a structure that is attached to said instrument.

17. The conductor routing means of claim 15, wherein said second signal conductor is attached to a musical instrument strap, wherein said strap is used to carry said instrument in a comfortable playing position for the musician.

18. The conductor routing means of claim 17, wherein said strap has built-in cord attachment means.

19. A sustainer for a musical instrument, said musical instrument having at least one vibratile element which produces the sound of said instrument, said instrument also having one or more pickups for sensing the vibrations of said one or more vibratile elements, wherein said pickup produces an electrical pickup signal in response to vibrations of said vibratile element or elements, wherein said sustainer comprises:

(A) a controller/amplifier, said controller/amplifier comprising:

(1) at least one signal processing circuit to process said pickup signal,

(2) at least one amplifier circuit to amplify said pickup signal, to provide a drive signal at the amplifier output;

(B) a transducer, which attaches physically to the body of said musical instrument, wherein said drive signal is applied to said transducer, causing said transducer to produce acoustic vibrations in response to said drive signal, wherein some portion of vibration energy produced by said transducer is imparted from said transducer to said instrument body and to said vibratile elements, wherein said vibration energy which is transferred to said vibratile elements is sufficient to sustain the vibration said vibratile elements;

(C) a conductor routing means for combining first and second electrical signals through a single multi-conductor electrical cable,

wherein said first signal is said pickup signal of said musical instrument, and said second signal is said drive signal, wherein the function of said transducer is to vibrate said body of said musical instrument in response to said drive signal, said transducer being mounted to the body of said instrument;

wherein a first signal conductor which carries said first signal joins to a first conductor of said multi-conductor electrical cable and wherein said second signal cable carrying said second signal joins to a second conductor of said multi-conductor electrical cable;

wherein said junctions of said first and second signal conductors to respective said first and second conductors of said multi-conductor cable are attached to said instrument.

20. A sustainer for a musical instrument, said musical instrument having at least one vibratile element which produces the sound of said instrument, said instrument also having one or more pickups for sensing the vibrations of said one or more vibratile elements, wherein said pickup produces an electrical pickup signal in response to vibrations of said vibratile element or elements, wherein said sustainer comprises:

(A) a controller/amplifier, said controller/amplifier comprising:

(1) at least one signal processing circuit to process said pickup signal,

(2) at least one amplifier circuit to amplify said pickup signal, to provide a drive signal at the amplifier output;

(B) a transducer, which attaches physically to the body of said musical instrument, wherein said drive signal is applied to said transducer, causing said transducer to produce vibrations in response to said drive signal, wherein some portion of vibration energy produced by said transducer is imparted from said transducer to said instrument body and to said vibratile elements, wherein said

vibration energy which is transferred to said vibratile elements is sufficient to sustain the vibration said vibratile elements, wherein said transducer is attached to said musical instrument by a clamp means having two opposing sides, at least one of said two opposing sides being movable so as to firmly clamp a part of a body of said musical instrument between said two opposing sides of said clamp means, and

(C) a conductor routing means for combining first and second electrical signals through a single multi-conductor electrical cable, wherein said first signal is said pickup signal of said musical instrument, and said second signal is said drive signal, wherein the function of said transducer is to vibrate said body of said musical instrument in response to said drive signal, said transducer being mounted to the body of said instrument;

wherein a first signal conductor which carries said first signal joins to a first conductor of said multi-conductor electrical cable and wherein said second signal cable carrying said second signal joins to a second conductor of said multi-conductor electrical cable;

wherein said junctions of said first and second signal conductors to respective said first and second conductors of said multi-conductor cable are attached to said instrument.

Sincerely,

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